

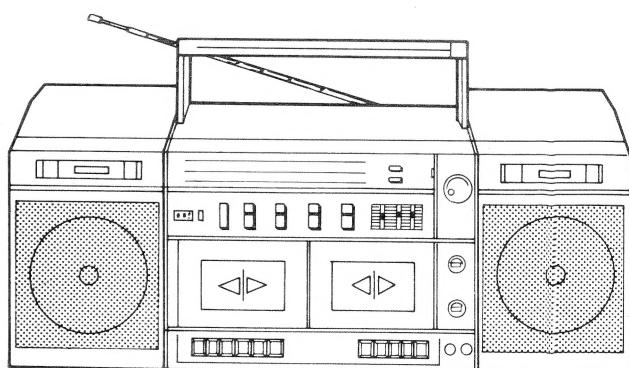
# GoldStar

## SERVICE MANUAL

### STEREO DOUBLE CASSETTE RECORDER

#### CAUTION

BEFORE SERVICING THE CHASSIS, READ THE "SAFETY PRECAUTIONS", IN THIS MANUAL



MODEL: TW-P52  
TW-P53



GoldStar

### To the service technician

The service manual contains detailed service information for model TW-P52 and TW-P53.

The basic difference between model TW-P52 and TW-P53 is radio band.

For example:

Model TW-P52 has the functions of FM, MW and LW.

Model TW-P53 has the functions of FM, MW and SW.

Illustration of the model appears on front cover.

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## SAFETY PRECAUTION

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual, electrical components having such features are identified by a  in the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

## SPECIFICATIONS

### •MW

Frequency Range .....	515—1630 KHz
Intermediate Frequency .....	465±1 KHz
Usable Sensitivity .....	52dB (400 Hz, 30% Mod)
S/N Ratio .....	40 dB
I.F. Rejection Ratio .....	30dB
10% T.H.D. Power Output .....	1500 mW (DC) 1200 mW (AC)
T.H.D. ....	3%
Frequency Response .....	125—2,000 Hz

### •FM

Frequency Range .....	87.35—108.25 MHz
Intermediate Frequency .....	10.7±0.1 MHz
Usable Sensitivity .....	14dB
S/N Ratio .....	60dB
I.F. Rejection Ratio .....	60dB
Automatic Frequency Control .....	280dB
10% T.H.D. Power Output .....	1500 mW (DC) 1200 mW (AC)
T.H.D. ....	3%
Frequency Response .....	0±4dB
Stereo Separation .....	20dB
Stereo T.H.D. ....	5%

### •LW

Frequency Range .....	140—290 KHz
Intermediate Frequency .....	455±1 KHz
Usable Sensitivity .....	65dB
S/N Ratio .....	30dB
I.F. Rejection .....	20dB

### •SW

Frequency Range .....	5.17—18.5 MHz
Intermediate Frequency .....	455±1 KHz
Usable Sensitivity .....	45dB
S/N Ratio .....	35dB

### •TAPE

Tape Speed .....	4.75 cm/sec.
Wow & Flutter .....	0.35%
Frequency Response .....	125—8,000 Hz
Distortion .....	3% (PLAY), 5% (REC/PLAY)
10% T.H.D. Output .....	150 mW
S/N Ratio .....	40dB (PLAY), 38dB (RECPLAY)
Erase Ratio .....	50dB
Graphic E.Q. Effect .....	±8dB

**•GENERAL**

Circuit System .....	4 Track 2 Channel Stereo
Speaker .....	Round 3.5" x 2
	Piezo x 2
Power Source .....	DC: 9V ("D" cell x 6) AC: 220V, 50 Hz
Antenna .....	FM/SW: Telescopic Rod Antenna MW/LW: Ferrite Bar Antenna

## DIAL CORD STRINGING

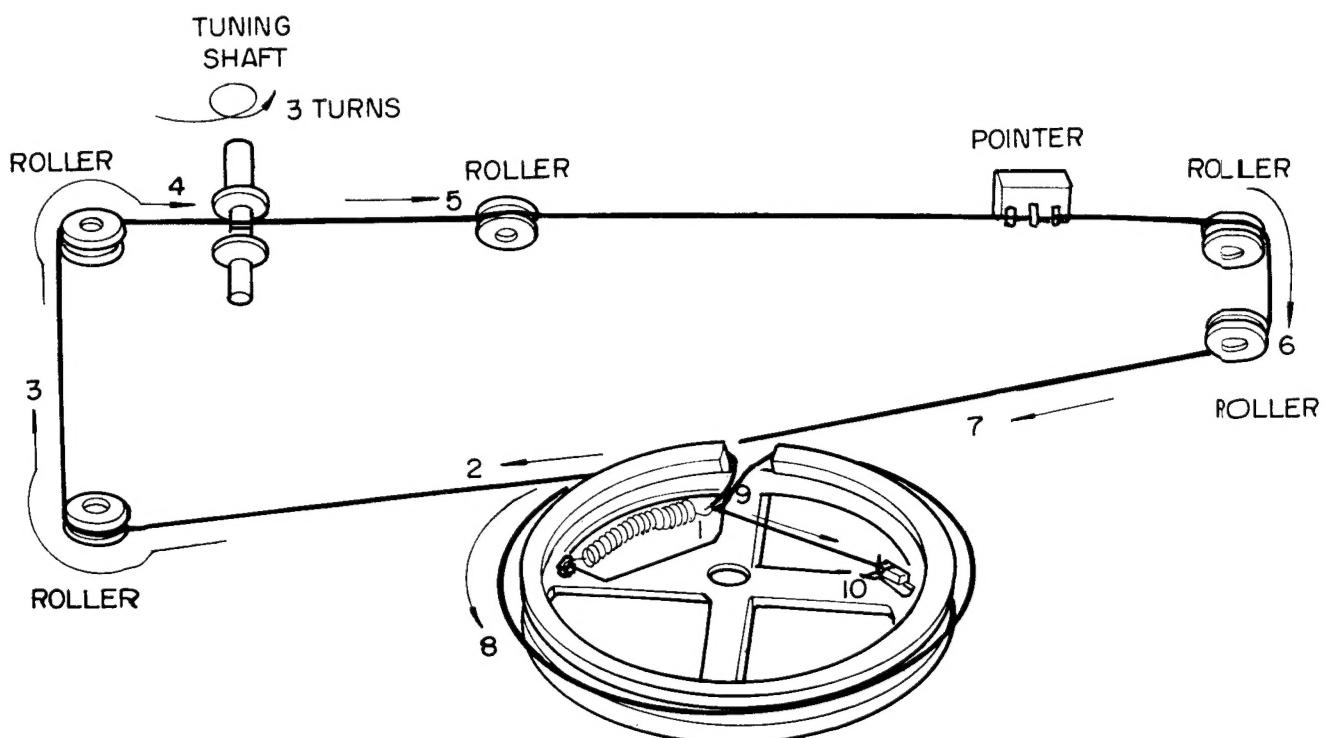


Figure 1.

Set the tuning capacitor to minimum frequency and string the cord following the numbers in figure 1.

# ADJUSTMENT

## Equipment Needed

1. AM Signal Generator
2. FM Signal Generator
3. IF Sweep Generator with marker Capabilities
4. FM Stereo Signal Generator
5. Oscilloscope
6. Output Meter (VTVM)
7. Frequency Counter
8. Nonmetallic Alignment Tools

## Important

1. Check power-source voltage.
2. Set the function switch to band being aligned.
3. Turn volume control to minimum unless otherwise noted.
4. Connect low side of signal source and output indicator to chassis ground unless otherwise specified.
5. Keep the signal input as low as possible to avoid AGC and AFC action.
6. Standard modulation is 400Hz at 30% for AM. (400Hz at 22.5kHz deviation for FM)

## Test and adjustment points

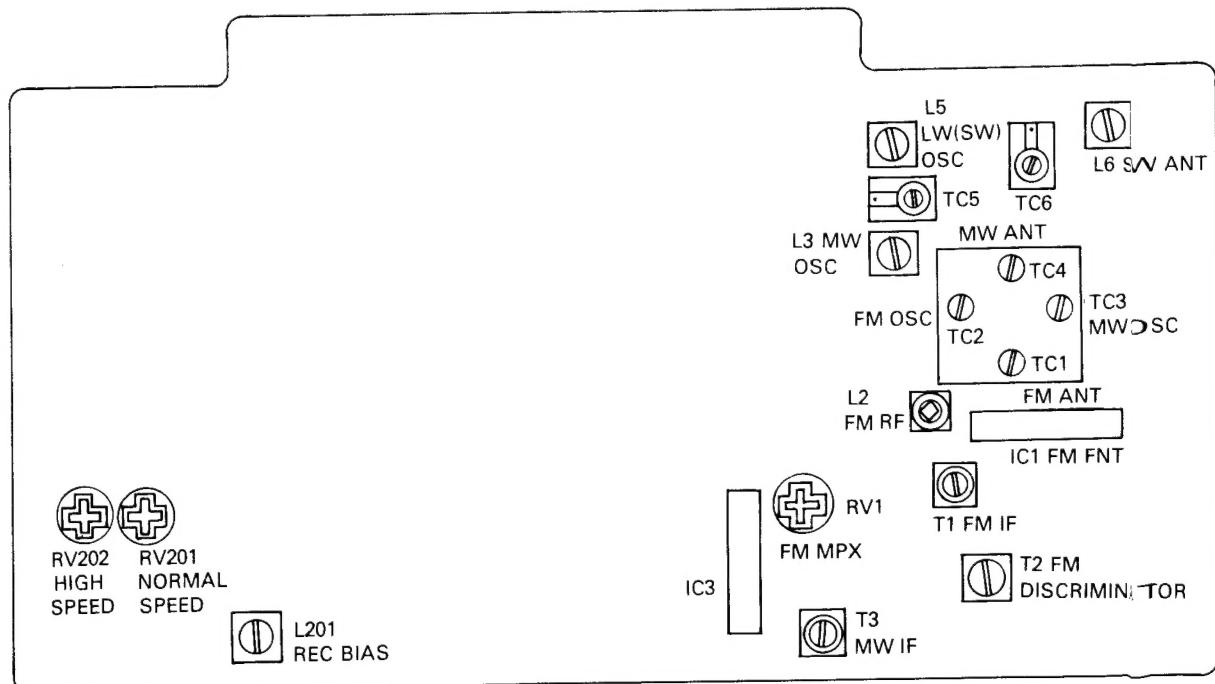


Figure 2. Main P.C. Board

## MW Section

Circuit Alignment	Equipment Connection	Step	Generator Frequency	Dial Setting	Adjustment
IF	Connect input of IF Genescope to C62 (+), output to MW Ant coil through the dummy. (Figure 3)	1	465. 455 KHz (400 Hz Mod.)	Tuning Gang fully closed	T3 (MW IFT) Adjust for maximum output
		2			Repeat until no further improvement can be made.
Band	AM Signal Generator with loop antenna. Output Meter (VTVM) across 4 ohm load. (Figure 4)	3	515 KHz (400Hz Mod.)	Tuning Gang fully closed	L3 (MW OSC. Coil) Adjust for maximum output.
		4	1630 kHz (400 Hz Mod.)	Tuning Gang fully open	TC3 (MW OSC, Trimmer). Adjust for maximum output.
		5			Repeat steps 3 & 4
Tracking	AM Signal Generator with loop antenna. Output Meter (VTVM) across 4 ohm load (Figure 4)	6	600 kHz (400 Hz Mod.)	Tune to signal	L4 (MW Ant. Coil). Adjust coil on ferrite core for maximum.
		7	1400 kHz (400 Hz Mod.)	Tune to signal	TC4 (MW Ant. Trimmer) Adjust for maximum output.
		8			Repeat steps 6 & 7 several times.

## LW Section

Circuit Alignment	Equipment Connection	Step	Generator Frequency	Dial Setting	Adjustment
Band	AM Signal Generator with loop antenna. Output Meter (VTVM) across 4 ohm load (Figure 4)	1	140 kHz (400 Hz Mod.)	Tuning Gang fully closed	L5 (LW OSC. Coil). Adjust for Coil on ferrite core.
		2	290 kHz (400 Hz Mod.)	Tuning Gang fully open	TC5 (LW OSC. Trimmer). Adjust for maximum output.
		3			Repeat steps 1 & 2
Tracking	AM Signal Generator with loop antenna. Output Meter (VTVM) across 4 ohm load. (Figure 4)	4	150 kHz	Tune to signal	L4 (LW Ant. Coil). Adjust for maximum output.
		5	270 kHz	Tuen to signal	TC6 (LW Ant. Trimmer) Adjust for maximum output.
		6			Repeat steps 4 & 5 several times.

## SW Section

Circuit Alignment	Equipment Connection	Step	Generator Frequency	Dial Setting	Adjustment
Band	AM Signal Generator to antenna terminals through SW dummy matching network. Output Meter (VTVM) across 4 ohm load. (Figure 6)	1	5.7 MHz (400 Hz Mod.)	Tuning Gang fully closed	L5 (SW OSC. Coil). Adjust for maximum output.
		2	18.5 MHz (400 Hz Mod.)	Tuning Gang fully open	TC5 (SW OSC, Trimmer). Adjust for maximum output.
		3			Repeat steps 1 & 2
Tracking	AM Signal Generator to antenna terminals through SW dummy matching network. Output Meter (VTVM) across 4 ohm load. (Figure 6)	4	6.5 MHz	Turn to signal	L6 (SW Ant. Coil). Adjust for maximum output.
		5			Repeat steps 4 & 5 several times.

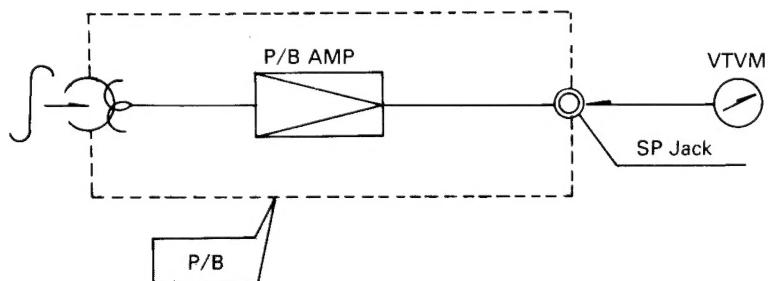
## FM Section

Circuit Alignment	Equipment Connection	Step	Generator Frequency	Dial Setting	Adjustment
IF	Connect input of IF Genescope to C20(-), output to the body of ICI through the dummy. (Figure 5)	1	10.7 MHz	Tuning Gang fully closed	T1, T2 (FM IFT). Adjust for maximum symmetrical response (10.7 MHz at the center point)
		2			Repeat step 1
Band	FM Signal Generator to antenna terminals through 75 ohm antenna matching network. Ouput Meter (VTVM) across 4 ohm load. (Figure 7)	3	87.35 MHz (400Hz Mod.)	Tuning Gang fully closed	L2 (FM OSC, Coil). Adjust for maximum ouput
		4	108.25 MHz (400 Hz Mod.)	Tuning Gang fully open	TC2 (FM OSC. Trimmer) Adjust for maximum output
		5			Repeat steps 3 & 4 seveal times.
Tracking	FM Signal Generator to antenna terminals through 75 ohm antenna matching network. Ouput Meter (VTVM) across 4 ohm load. (Figure 7)	6	90 MHz (400 Hz Mod.)	Tune to signal	L1 (FM Ant. Coil). Adjust for maximum ouput
		7	106 MHz (400 Hz Mod.)	Tune to signal	TC1 (FM Ant Trimmer). Adjust for maximum output.
		8			Repeat steps 6 & 7 to obtain suitable sensitivity at 90 MHz and 106 MHz.

## FM MPX

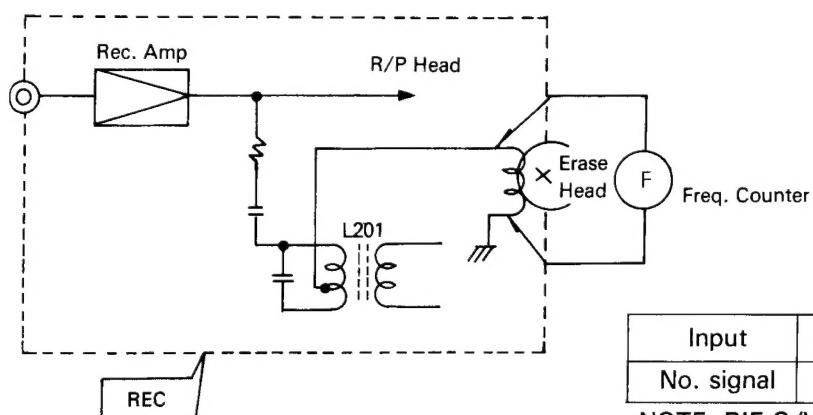
Circuit Alignment	Equipment Connection	Step	Generator Frequency	Dial Setting	Adjustment
38 kHz ± 0.1 kHz	FM Stereo Generator composite out connected to Ext. Mod of FM Signal Generator.	1			First make sure FM section properly aligned.
	FM Signal Generator to antenna terminals matching 75 ohm antenna matching network. Frequency Counter across TP (Pin No. 6 of IC3) (Figure 8)	2	98 MHz (1 mV output)	98 MHz	Adjust RV1 for Frequency Counter indicates 38 kHz ± 0.1 kHz.

## Azimuth Adjustment



Input	Adjust for	Adjustment
MTT-114 (10 kHz)	Maximum	Azimuth Adjusting screw

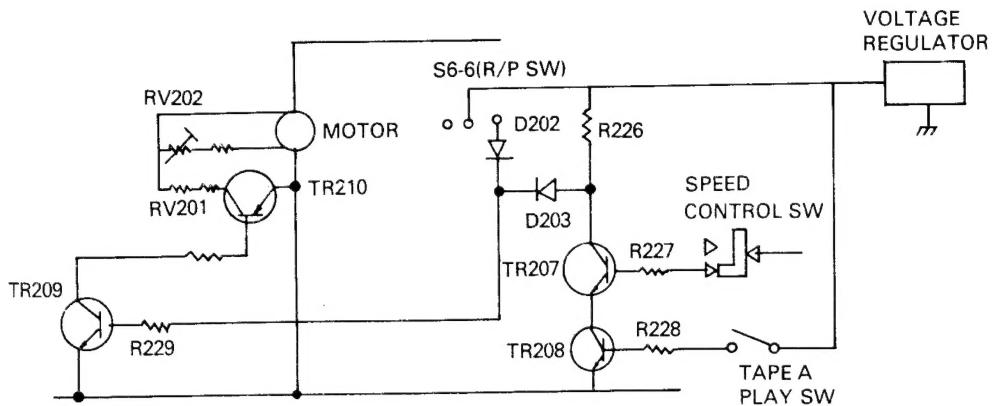
## Bias Frequency Adjustment



Input	Adjust for	Adjustment
No. signal	60 kHz	L201

NOTE. RIF S/W: "2" position.

## MOTOR SPEED ADJUSTMENT



### ① HI-SPEED ADJUSTMENT

Dubbing switch: High-speed

Input	Adjust for	Adjustment	Output
GTT-111	6000Hz ± 30Hz	RV202	Speaker Out

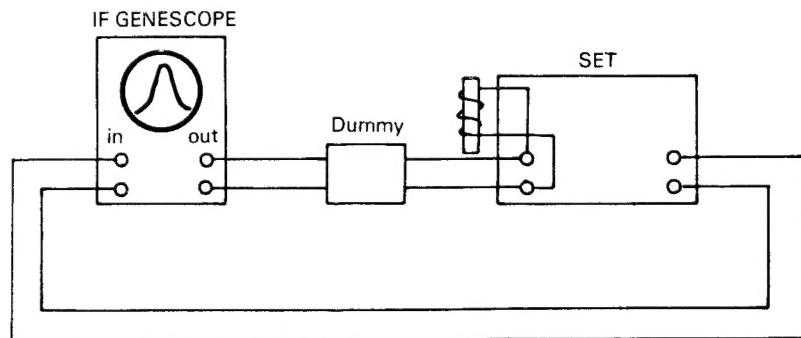
### ② NORMAL-SPEED ADJUSTMENT

Dubbing switch: Normal-speed

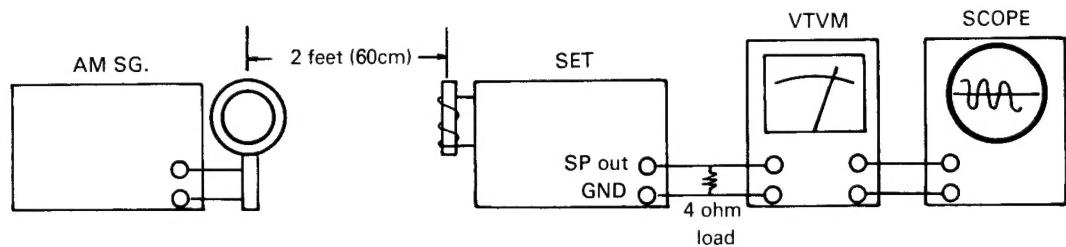
Input	Adjust for	Adjustment	Output
GTT-111	3000Hz ± 30Hz	RV201	Speaker out

## TEST EQUIPMENT CONNECTIONS

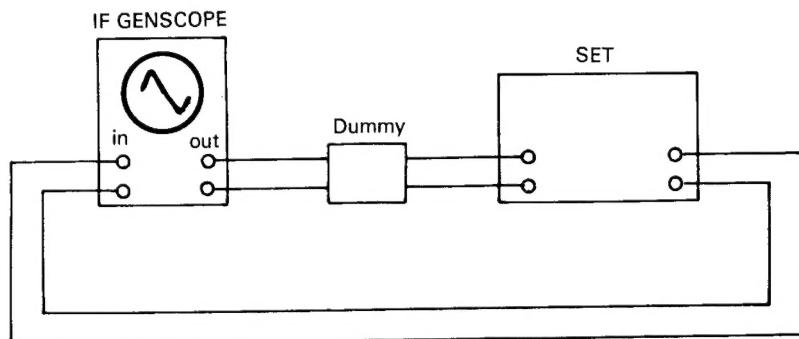
Figure 3 MW IF



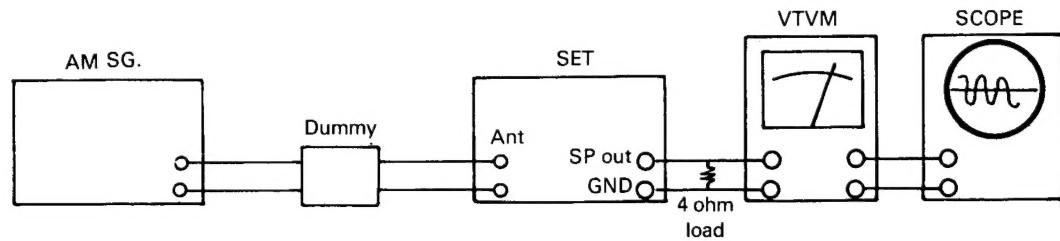
**Figure 4. LW & MW Band/Tracking**



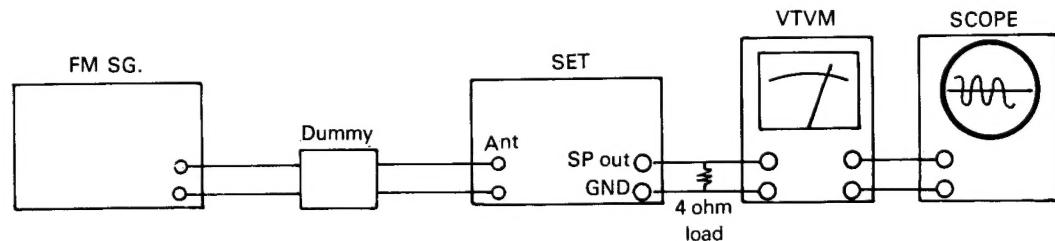
**Figure 5. FM IF**



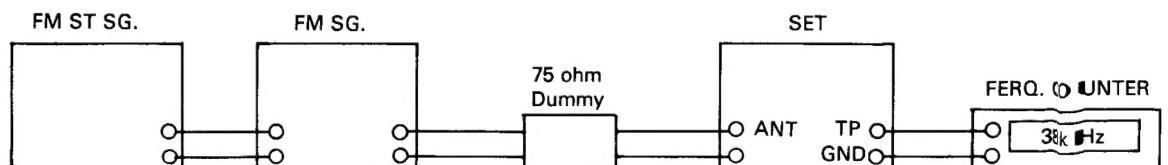
**Figure 6. SW Band/Tracking**



**Figure 7. FM Band/Tracking**



**Figure 8. 38 kHz Pilot**



## STANDARD MAINTENANCE

### Tape Head and Capstan Cleaning

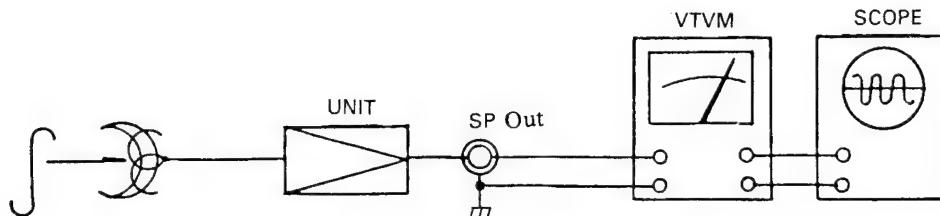
Whenever a unit is brought in for service or repair, clean the tape heads, capstan drive shaft and other tape handling surfaces to ensure proper tape handling and optimum frequency response. Use a cotton swab dipped in head cleaner or denatured alcohol to clean all tape handling surfaces. Wipe dry.

### Tape Head Demagnetization

Do not use magnetized tools near the tape heads, since they can magnetize the head. After long period of the heads will retain a small amount of residual magnetism. A magnetized head will result in loss of high frequency response and increased noise, use a standard tape head demagnetizer and follow the instructions supplied with it to demagnetize the heads.

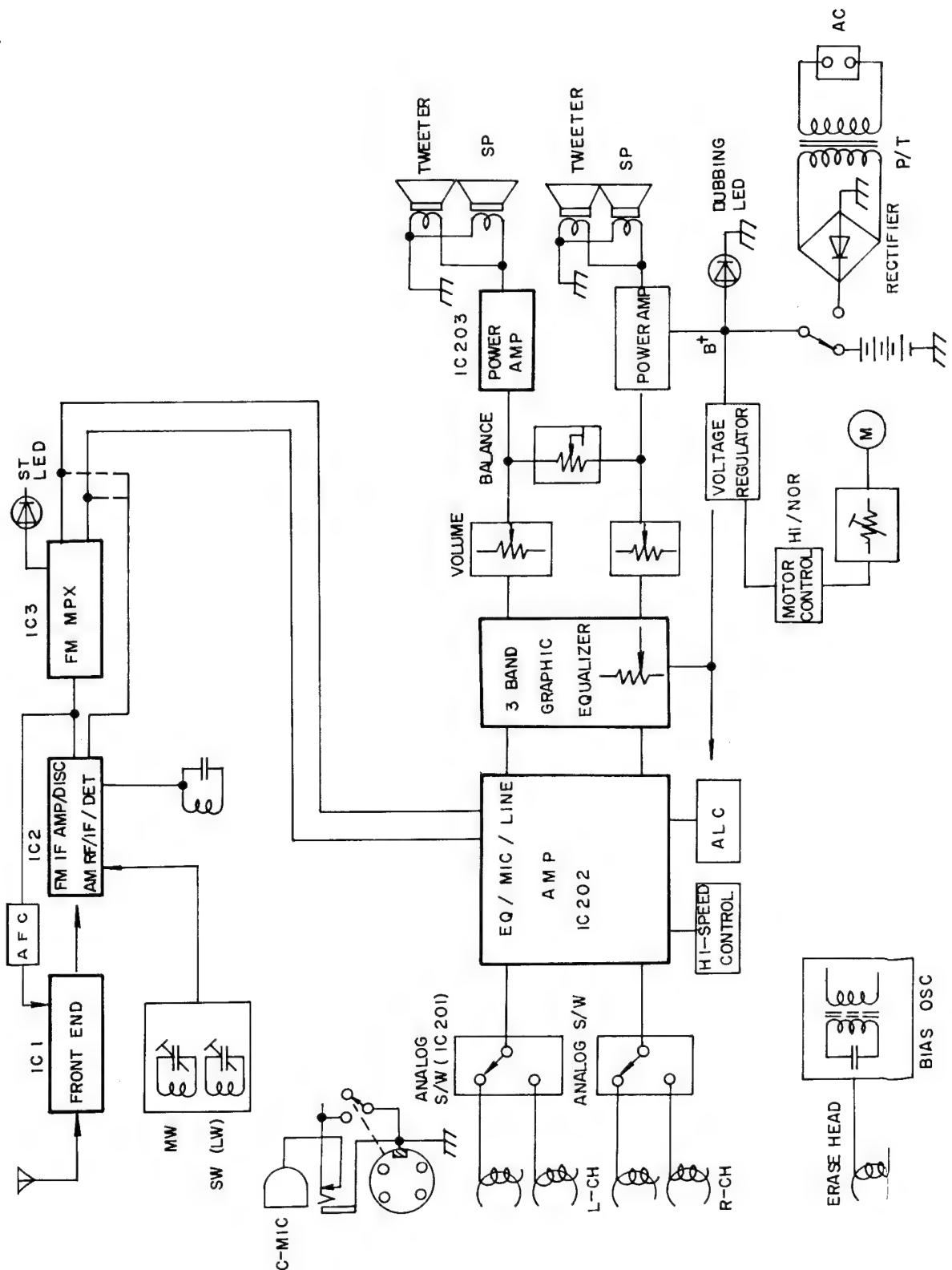
### Azimuth Adjustment

1. Azimuth adjustment is normally required when the head is replaced, or for cases of cross-talk and poor high frequency response. A test tape is required for such adjustment.
2. Connect a scope or VTVM to the right channel EXT. SP jack. Insert a test tape into the unit (use a test tape such as TEAC MTT-114, MTT-115). Adjust the azimuth adjustment screw for maximum output onto the right channel. Use glyptal or other non-hardening cement to lock the azimuth adjustment screw.



(Left channel is the same as right)

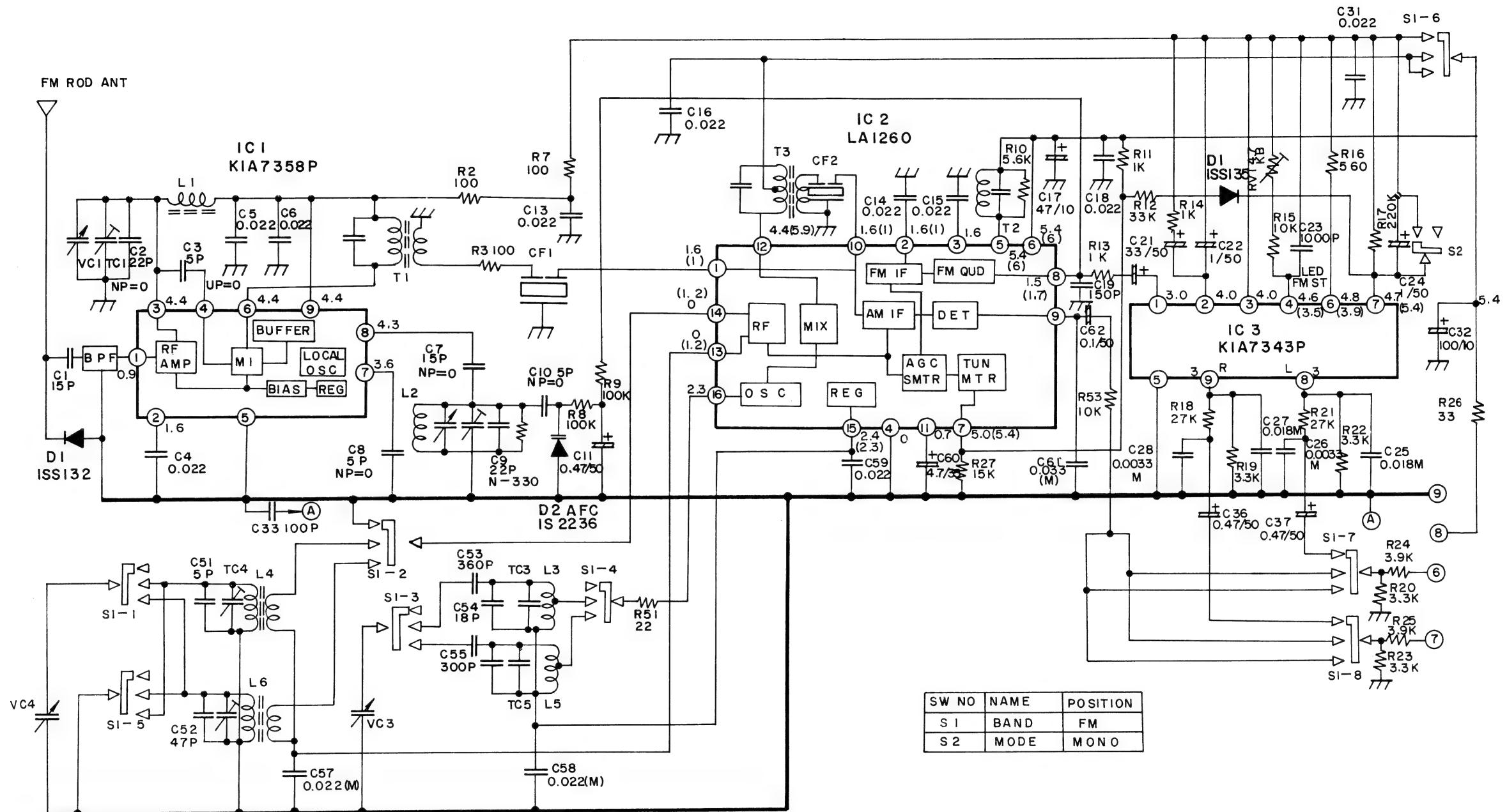
## BLOCK DIAGRAM



## SCHEMATIC DIAGRAM

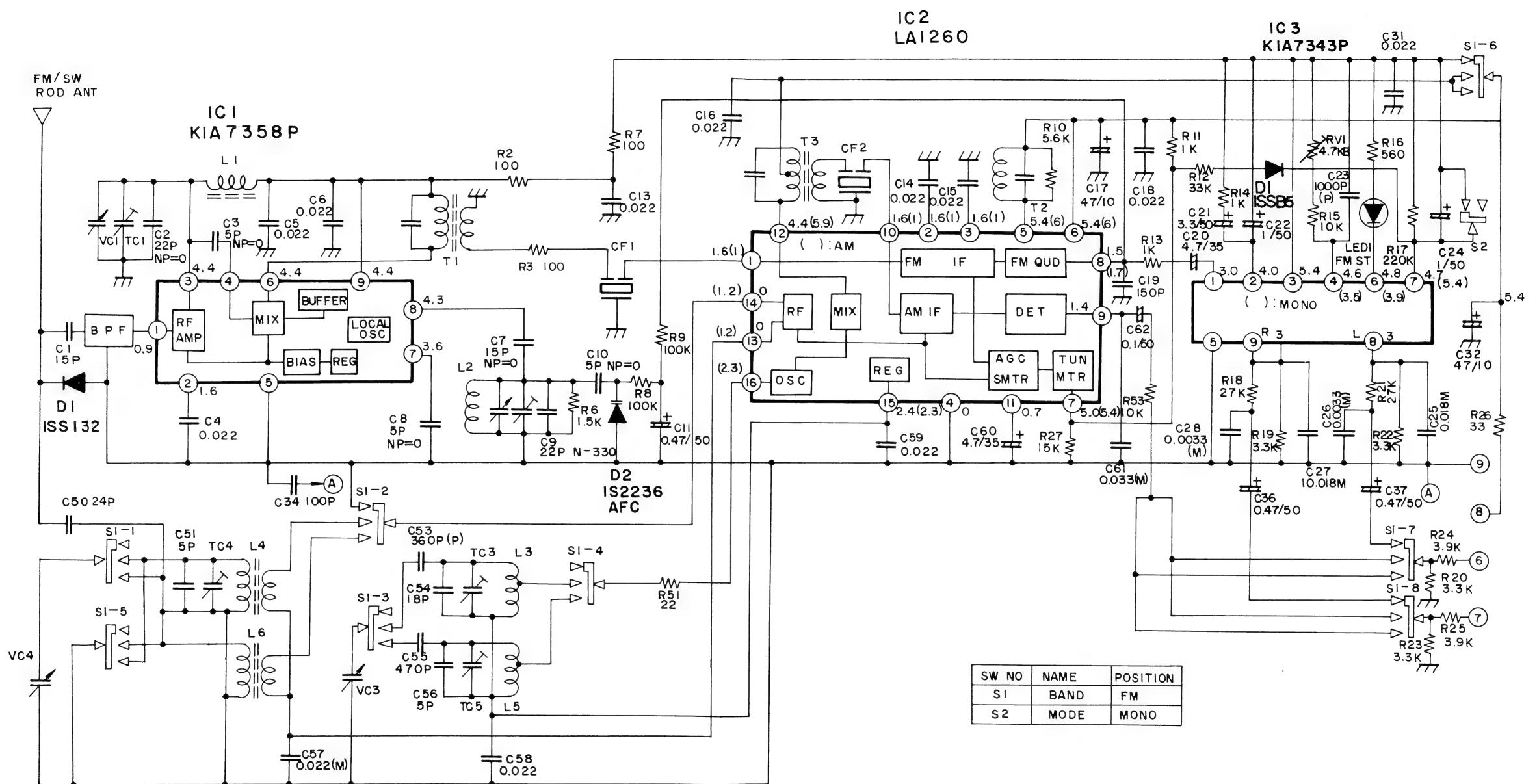
### • RF CIRCUIT (TW-P52)

TW-P52



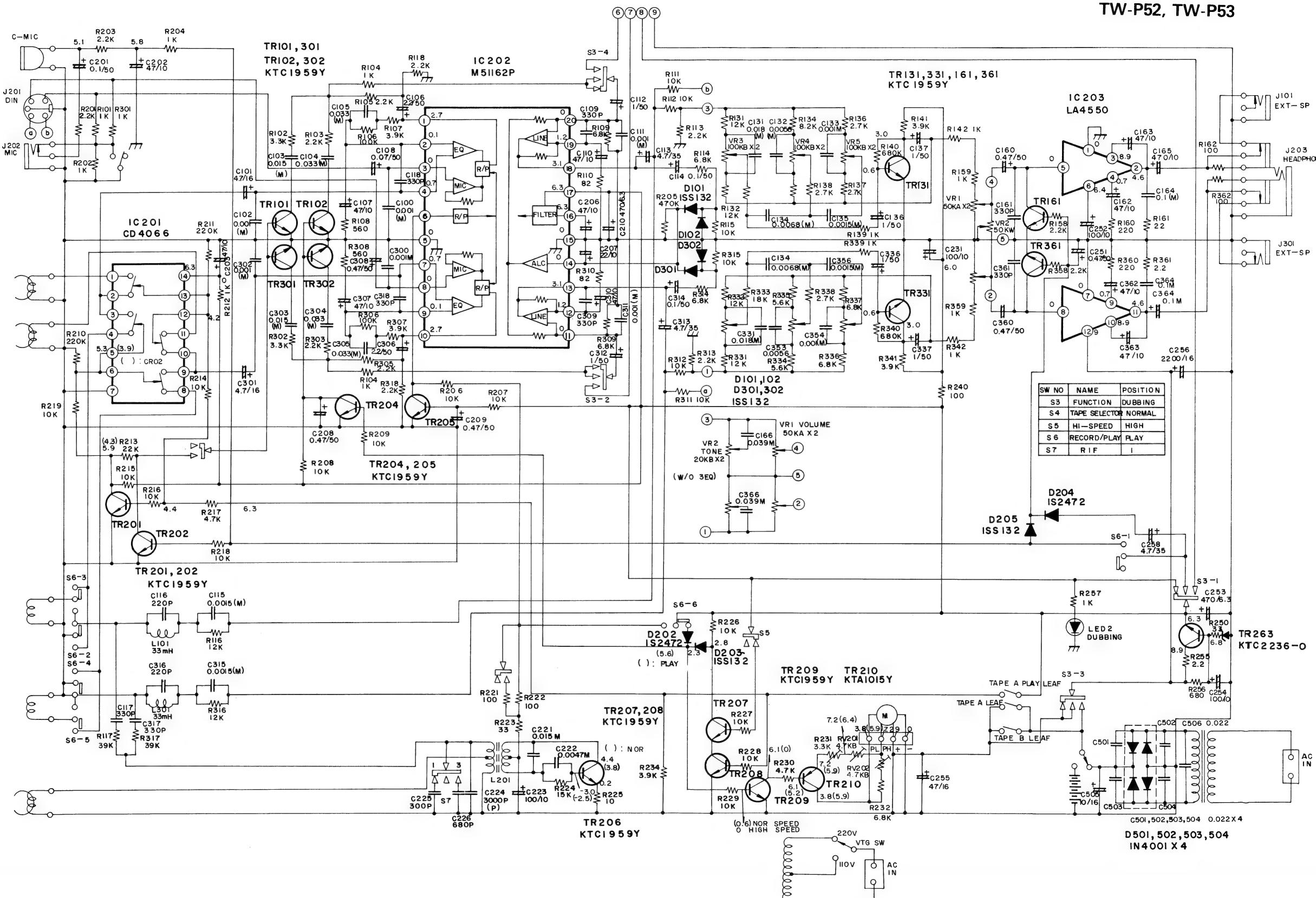
#### • RF CIRCUIT (TW-P53)

TW-P53

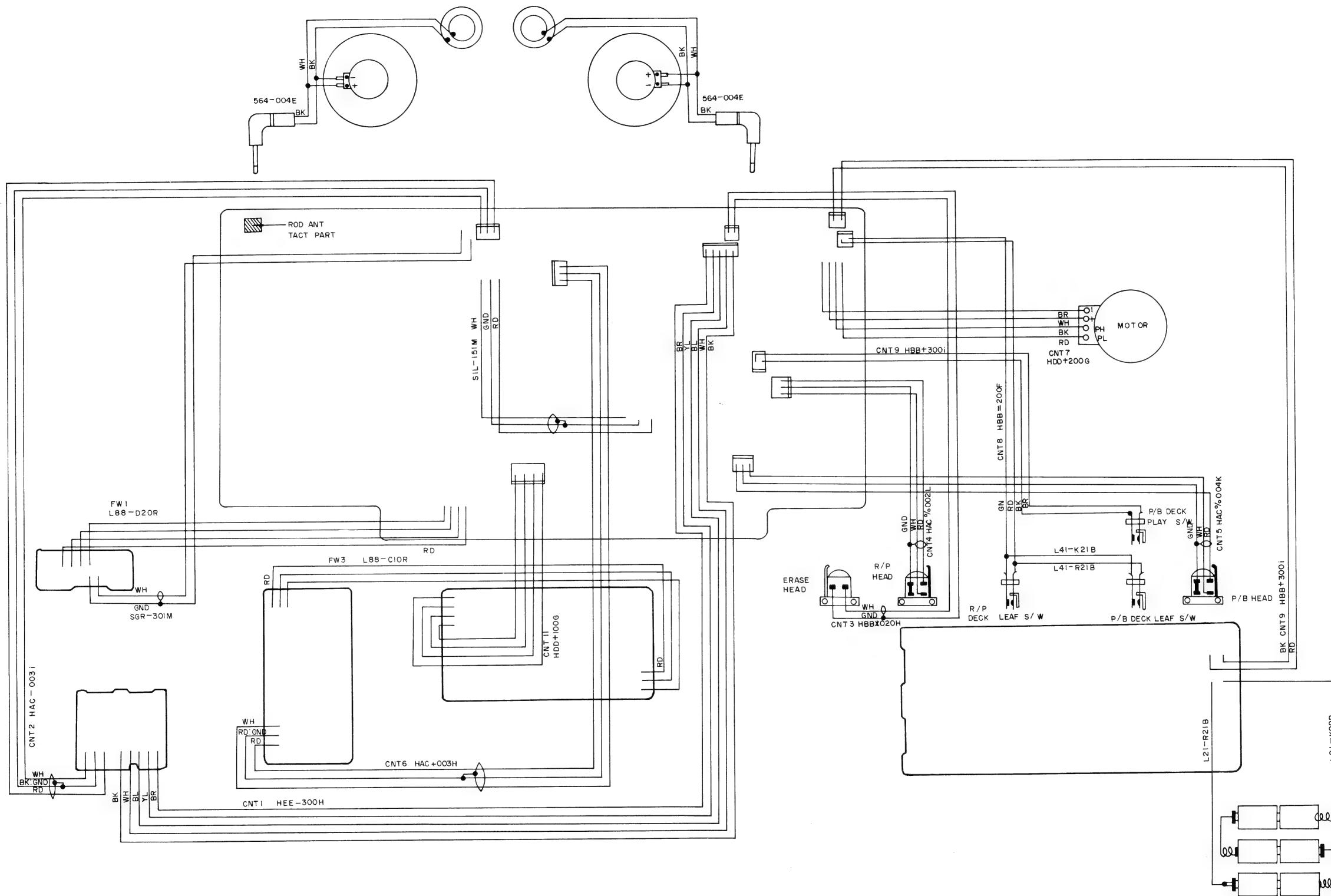


• AUDIO CIRCUIT (TW-P52, TW-P53)

TW-P52, TW-P53



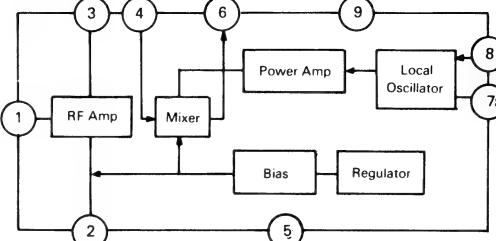
## WIRING DIAGRAM



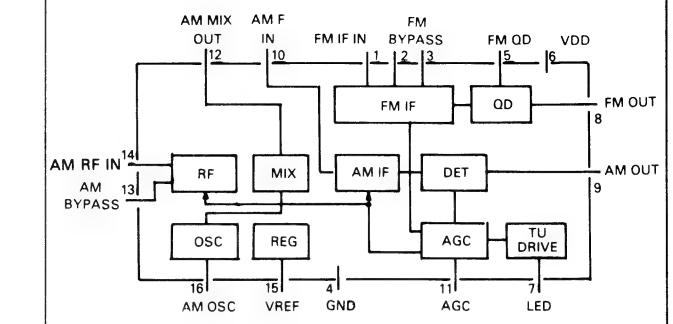
# NOTES

## IC INTERNAL DIAGRAM

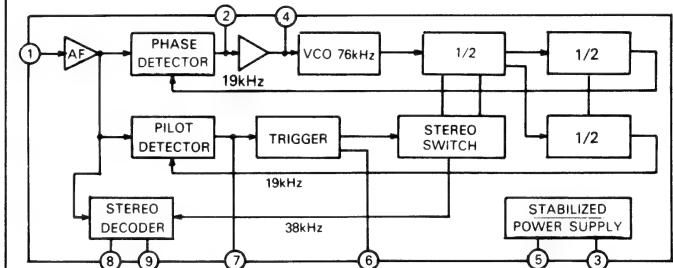
IC1 KIA7358P



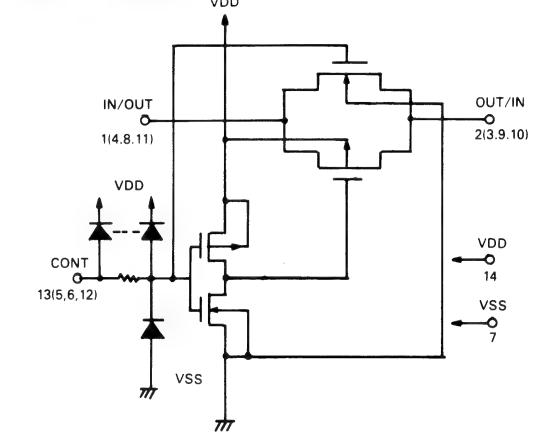
IC2 LA1260



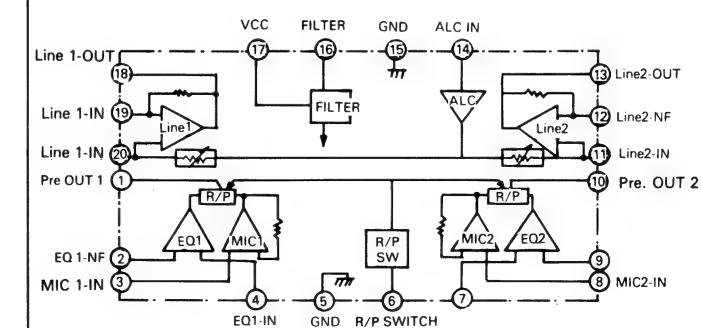
IC3 KIA7343P



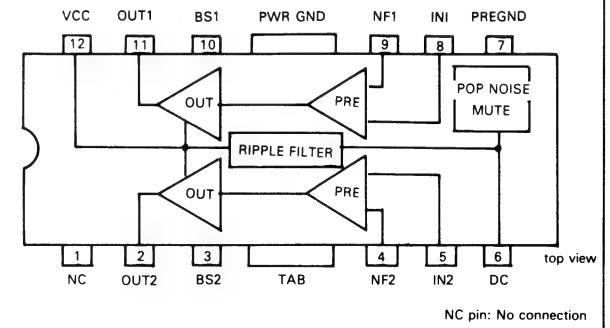
IC201 LA4016B



IC202 M51162P

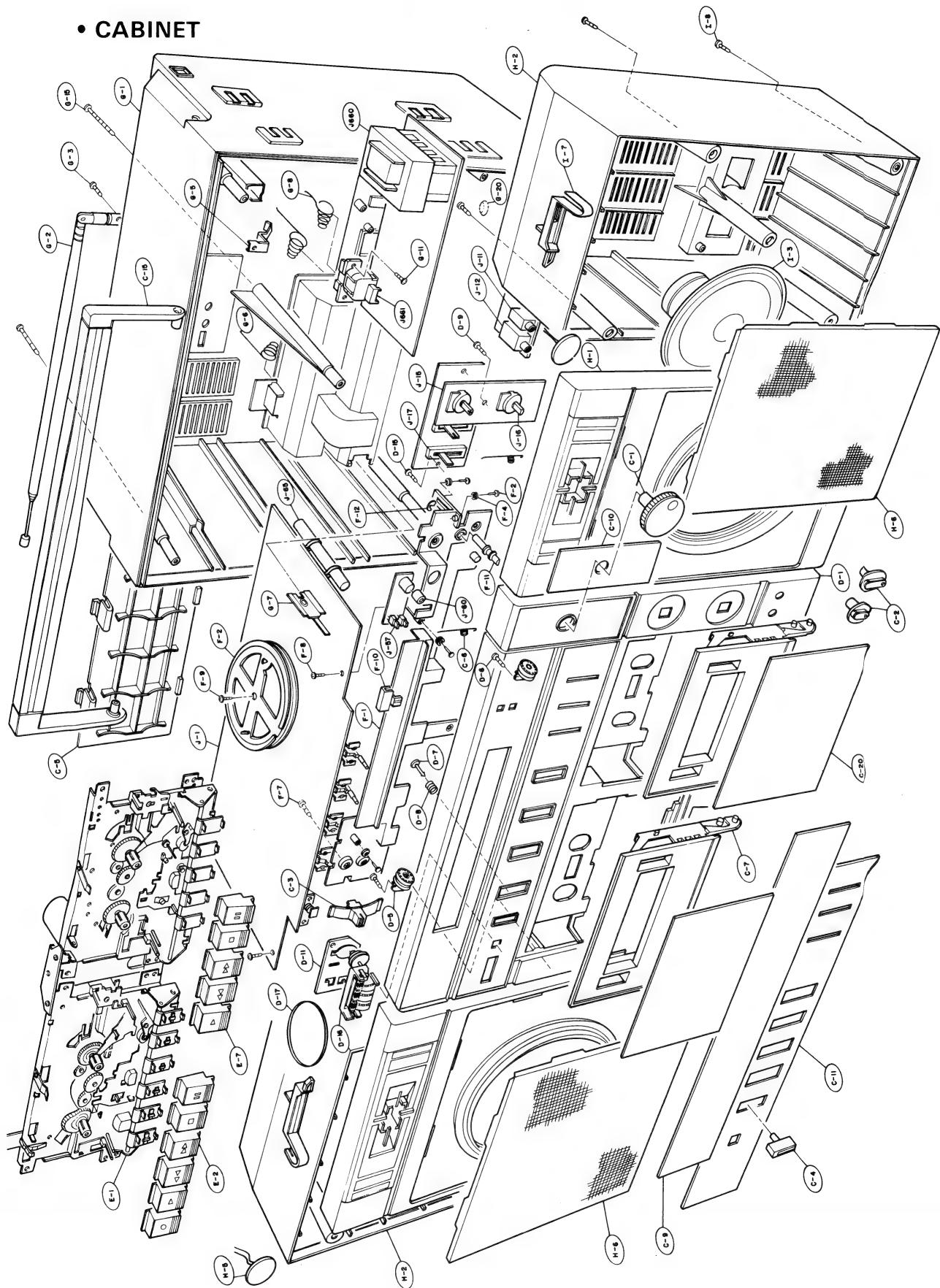


IC203 LA4550

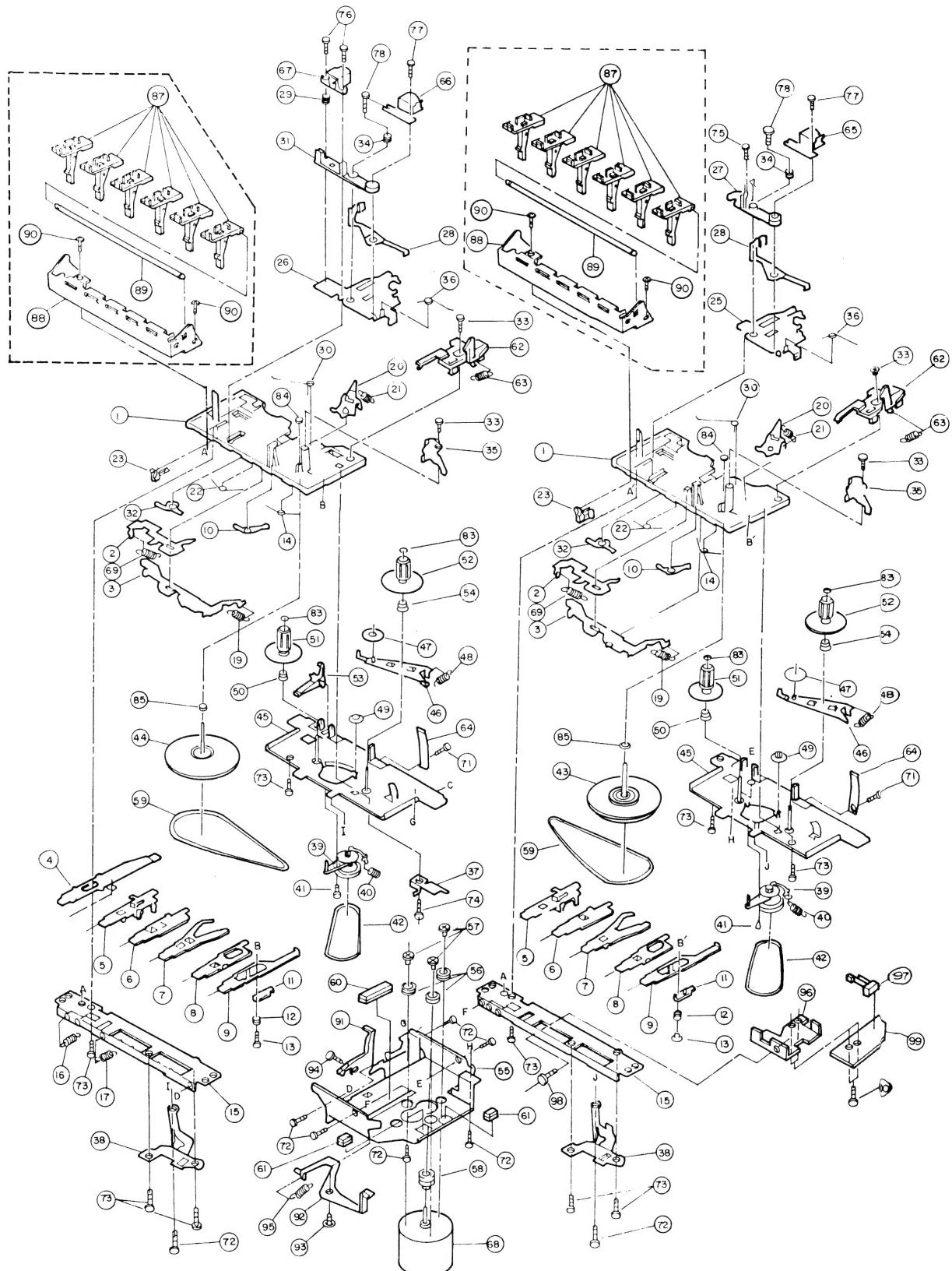


## EXPLODED VIEW

### • CABINET



## • DECK MECHANISM



Note: Excluded parts in the part list are not available as replacement parts.

## REPLACEMENT PARTS LIST

**PRODUCT SAFETY NOTICE:** Products marked with a  have special characteristics important to safety. Before replacing any of these components, read carefully the safety precatuion of this service manual, don't degrade the safety of the receiver through improper servicing.

### • ELECTRICAL

Ref. No.	Mfr's Part No.	Description	Ref. No.	Mfr's Part No.	Description
<b>INTEGRATED CIRCUITS</b>					
IC1	668-108D	KIA7358P (FM Function)	L5	634-037S	Coil, LW OSC (TW-P52)
IC2	668-192B	LA1260 (AM/FM IF)	L6	634-020H	Coil, SW OSC (TW-P53)
IC3	668-159A	KIA7343P (MPX)	L101	637-005B	Coil, SW ANT (TW-P53)
IC201	668-662B	CD4016 (Analog Switch) or	L201	634-036C	Coil, Peaking 33 $\mu$ H
	668-662C	LC4016B (Analog Switch)	L301	637-005B	Coil, Peaking 33 $\mu$ H
IC202	668-660A	M51162P (EQ + Line)	T1	644-018F	Trans. FM IF
IC203 	668-668A	LA4550 (Power)	T2	647-011E	Discriminator
<b>TRANSISTORS</b>					
TR101, 102	665-814B	KTC1959-Y	S1	556-611L	Switch, Band
TR131	665-814B	KTC1959-Y	S2	556-611M	Switch, Mode
TR161	665-814B	KTC1959-Y	S3	556-611A	Switch, Function
TR201, 202	665-814B	KTC1959-Y	S4	556-611M	Switch, Tape Selector
TR203-209	665-814B	KTC1959-Y	S5	556-631A	Switch, Hi-speed
TR210	665-813B	KTA1015-Y	S6	552-035B	Switch, Slide (P/P)
TR263	665-881B	2SC2236-O	S7	552-614A	Switch, Slide (RIF)
TR301, 302	665-814B	KTC1959-Y	J101	571-001C	Jack, D = 3.5
TR331	665-814B	KTC1959-Y	J201	573-075E	Socket, TCSO70
TR361	665-814B	KTC1959-Y	J202	571-001C	Jack, D = 3.5
<b>DIODES</b>					
D1	651-031A	Switch, 1SS132	J203	571-102A	Jack, D = 3.5
D2	654-418A	AFC, 1S2236	J301	571-001C	Jack, D = 3.5
D3, 4	651-031A	Switch, 1SS132	<b>MISCELLANEOUS</b>		
D5	654-772G	Zener, DZ 3.6B	VR1	611-6490	VR, 50KA (Volume)
D101, 102	651-031A	Switch, 1SS132	VR2	611-948Q	VR, 50KW (Balance)
D202	652-605B	Switch, 1S2472	VR3-5	612-619A	VR, 100KB
D203	651-031A	Switch, 1SS132	RV1	613-002C	VR, Semi-fixed 4.7KB
D261	654-723C	Zener, DZ6.8B	RV202, 202	613-002C	VR, Semi-fixed 4.7KB
D301, 302	651-031A	Switch, 1SS132	VC1-4	622-012C	Varicon, P62S-2BP T
D501-504	652-005C	Rect, DS4001	TC5	623-023H	Trimmer (TW-P52)
LD1, 2	653-625A	LED, KLR208E (RD)	TC6	623-023B	Trimmer (TW-P53)
<b>COILS AND TRANSFORMERS</b>			CF1	616-008A	Trimmer
L1	635-009H	Coil, FM RF	CF2	616-003E	Filter, SFE10, 7NS2 (BL, RD, OR)
L2	635-020B	Coil, FM RF (OSC)	BPF	616-011G	Filter, SFU 465B
L3	634-037N	Coil, MW OSC		641-724C	Filter, Band pass MB8
L4	632-211F	Coil, MW/LW Antenna (TW-P52)		557-005C	Trans, Power
	632-211E	Coil, MW Antenna (TW-P53)		542-035B	Socket, AC-in
					Condenser Mic.

• CABINET

Ref. No.	Mfr's Part No.	Description	Ref. No.	Mfr's Part No.	Description
A-12	681-035A	Power Cord	E-7	275-055L	Button, Deck (Record)
C-1	271-053B	Knob, Tuning	E-8	442-017A	Spring, Record
C-2	273-003A	Knob, Control	E-8-1	442-017B	Bracket, Record (A)
C-3	273-009A	Knob, Lever Switch	E-8-2	442-017C	Bracket, Record (B)
C-4	273-040A	Knob, Push	E-8-3	353-025D	Screw, Special
C-5	221-395C	Cover, Battery	E-9	MRC0918J	Screw (For Deck and Spring Record Fix)
C-6	442-750A	Spring, Door			
C-7	217-057A	Case, Cassette	E-15	MBC0726L	Screw, MBC + 1
C-8	236-035C	Window, Door (Left)	E-16	513-100A	PCB Leaf Switch
C-9	236-050Y	Window, Scale (TW-P52)	F-1	313-051A	Chassis
	236-036A	Window, Scale (TW-P53)	F-2	431-052A	Fulley, Dial
C-10	236-037A	Window, Tuning	F-3	423-254A	Shaft, Roller
C-11	236-051Y	Window, Function (TW-P52)	F-4	434-017A	Roller
	236-038A	Window, Function (TW-P53)	F-6	442-004E	Spring
			F-7	353-025G	Screw, Special (For Chassis and Front)
C-15	261-038A	Handle, Ass'y	F-8	353-025G	Screw, Special
C-15-1	324-051A	Holder, Handle			(For Chassis and PCB)
C-15-2	261-039A	Handle Bar	F-9	MPC1530J	Screw, MPC + 2 (For Fulley and VR)
C-20	236-035B	Window, Door (Right)			
D-1	217-053A	Case, Front	F-10	361-010Z	Pointer
D-5	444-111A	Damper Ass'y	F-11	423-139A	Shaft, Tuning
D-5-1	444-112A	Damper, Gear	F-15	886-0010	Dial Cord
D-5-2	324-112A	Holder, Gear	G-1	217-0540	Case, Rear
D-6	353-025G	Screw, Special	G-2	532-205B	Rod Antenna
D-7	324-426A	Holder, Push Knob	G-3	MAC1839I	Screw, MAC + 3x10 (For Rod Antenna)
D-8	442-634G	Spring, Knob			
D-9	353-025G	Screw, Special (For VR PCB and Case Front)	G-5	536-917A	Terminal, Antenna
			G-6	442-761A	Spring, Battery (2)
			G-7	563-126F	Terminal, Battery
D-10	321-656A	Bracket-Wire, Holder	G-8	442-714A	Spring, Battery (A)
D-11	321-188A	Bracket, Counter	G-10	442-760A	Spring, Battery (Y)
D-12	353-025G	Screw, Special (For Counter Bracket and Front)	G-11	353-025G	Screw, Special (For 2P and Rear)
			G-15	353-041F	Screw (For Case Fix)
D-15	353-025G	Screw, Special (For EQ PCB and Front Fix)	G-20	447-059A	Cushion, Speaker
			G-21	354-601F	Washer, Metal
			G-22	353-025G	Screw, Special
D-16	517-114D	Tape Counter			(For Power Transistor Fix)
D-17	451-146D	Belt Counter			
D-18	432-019B	Pulley, Motor	H-1	217-055A	Case, Speaker Front
D-20	423-002A	Shaft, Idlear	H-2	217-056A	Case, Speaker Rear
D-21	353-025G	Screw, Special (For Deck and Front Case Fix)	H-3	541-136D	Speaker
			H-5	541-186B	Pizo, Speaker
			H-6	224-085A	Grille Speaker
E	412-017A	Deck Ass'y	H-7	334-058A	Stopper-2
E-1	419-011H	Deck Mechanism	H-8	353-025K	Screw, Special (For Speaker Case Fix)
E-2	275-055G	Button, Deck (Pause)			
E-3	275-055H	Button, Deck (Stop)	H-9	564-004A	Cord, Speaker
E-4	275-055I	Button, Deck (F.F.)	H-10	353-0520	Screw, Special (For Stopper)
E-5	275-055J	Button, Deck (Rew)			
E-6	275-055K	Button, Deck (Play)	H-12	472-604J	Felt

Ref. No.	Mfr's Part No.	Description	Ref. No.	Mfr's Part No.	Description
I-1	217-055A	Case, Speaker Front	I-9	564-004A	Cord, Speaker D = 3.5 (BK)
I-2	217-056B	Case, Speaker Rear	I-10	353-052D	Screw, Special
I-3	541-136D	Speaker	I-12	472-604J	Felt
I-5	541-186B	Piezo Speaker	J	513-122B	PCB Ass'y, Main
I-6	224-085A	Grill Speaker	J-61	255-086B	Heatsink
I-7	334-058B	Stopper-R	J-62	253-008A	Shield, Plate (D)
I-8	353-025K	Screw, Special			

#### • DECK MECHANISM

Ref. No.	Mfr's Part No.	Description	Ref. No.	Mfr's Part No.	Description
11	99T-1079	Pause Lever	56	99T-0989	Motor Rubber
12	99T-0911	Pause Lever Spring	57	99T-0990	Coller Screw
13	99T-0912	Pause Stopper	58	99T-1101	Motor Pulley
14	99T-0921	Button Lever Spring (C)	59	99T-0980	Main Belt
16	99T-0915	Button Lever Spring (A)	62	99T-1026	Eject Slide Lever
17	99T-0916	Play Button Lever Spring(S)	63	99T-0953	Eject Slide Lever Spring
23	99T-1103	Leaf Switch	65	99T-1132	PB Head
27	99T-1055	Head Base	66	99T-1143	RP Head
28	99T-0924	Sensing Plate Ass'y	67	99T-1098	Erase Head
30	99T-0926	Head Panel Spring (S)	68	99T-1102	Motor
31	99T-0923	Head Base	72	99T-0961	Tap Screw M2x4
35	99T-0929	Pinch Roller Arm Ass'y	77	99T-0964	Cap Screw M2x7
36	99T-1081	Pinch Roller Spring	83	99T-0967	P Washer C, 12x3x04
38	99T-1112	Metal Guide	84	99T-0968	P Washer Cut
39	99T-1130	RF Pulley Arm Ass'y	87	99T-1141	Operation Lever
40	99T-0932	RF Pulley Arm Spring	88	99T-1142	Button Frame (S)
42	99T-0934	RF Belt	89	99T-1030	Button Lever Shaf
47	99T-1116	T-Up Roller Gear	90	99T-0977	FH Screw M2x7
48	99T-0940	T-G Plate Spring	91	99T-0970	P Kick Lever (B)
51	99T-0985	S-Reel Ass'y	92	99T-0992	P Kick Lever-A
52	99T-0986	T-Reel Ass'y	95	99T-0974	P Kick Lever Spring
53	99T-1119	Rec Safety Lever	97	99T-1134	Play Leaf Switch
55	99T-0988	Motor Bracket	99	513-100A	PWB Leaf Switch